UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/710,772	08/02/2004	Arthur G. Rodgers	04-0558	4771

24319 7590 02/15/2007

LSI LOGIC CORPORATION
1621 BARBER LANE
MS: D-106
MILPITAS, CA 95035

EXAMINER	
DWIVEDI, MAHESH H	
ART UNIT	**PAPER NUMBER**
2168	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/15/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/710,772	RODGERS ET AL.	
	Examiner	Art Unit	
	Mahesh H. Dwivedi	2168	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 August 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Receipt of Applicant's Amendment, filed on 11/21/2006, is acknowledged. The amendment includes the amending of the specification.

Specification

2. The objections raised in the office action mailed on 08/22/2006 have been overcome by the applicant's amendments received on 11/21/2006.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-17, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Nakayama et al.** (U.S. Patent 6,907,001) and in view of **Erimli et al.** (U.S. Patent 6,842,423).

5. Regarding claim 1, **Nakayama** teaches a method comprising:

A) receiving a plurality of queue items at an input queue (Column 4, lines 51-62, Figure 1);

B) wherein the input queue feeds a plurality of output queues that feed one or more output ports (Column 4, lines 32-40, Figure 1);

C) determining whether a particular one of a plurality of output queues contains a number of queue items that meets or exceeds a pre-determined amount (Column 4, lines 51-67-Column 5, lines 1-11); and

D) in response to a determination that the particular one of the plurality of output queues contains a number of queue items that meets or exceeds the predetermined amount, preventing any queue items that have a same corresponding output port as the particular one of the plurality of output queues and that have a queue item priority greater than or equal to the queue priority of the particular one of the plurality of output queues from exiting the input queue (Column 4, lines 63-67-Column 5, lines 1-11).

The examiner notes that **Nakayama** teaches **"receiving a plurality of queue items at an input queue"** as "a plurality of packets destined for the same output port

are input simultaneously partially over a time base from a plurality of input lines" (Column 4, lines 52-54). The examiner further notes that **Nakayama** teaches **"wherein the input queue feeds a plurality of output queues that feed one or more output ports"** as "sending the cells to switch input ports LI (LI-1 to LI-n); a switching unit 3 having a plurality of input ports LI-1 to LI-n and output ports LO-1 to LO-n and switching the input cells from the input ports to any one of the output ports specified by the routing information" (Column 4, lines 35-40). The examiner further notes that **Nakayama** teaches **"determining whether a particular one of a plurality of output queues contains a number of queue items that meets or exceeds a pre-determined amount"** as "the quantity of stored cells destined for a specified output port exceeds a predetermined threshold value within the switch, the input line interfaces sending the cells destined for the specified output port selectively inhibits the forwarding or sending out of cells according to the order of priority of the cells in response to the notice of congestion informed to each of the input line interfaces from the congestion notifier 4 by way of the signal line 19" (Column 4, lines 54-62). The examiner further notes that **Nakayama** teaches **"in response to a determination that the particular one of the plurality of output queues contains a number of queue items that meets or exceeds the predetermined amount, preventing any queue items that have a same corresponding output port as the particular one of the plurality of output queues and that have a queue item priority greater than or equal to the queue priority of the particular one of the plurality of output queues from exiting the input queue"** as "the quantity of stored cells destined for a specified output port exceeds a

predetermined threshold value within the switch, the input line interfaces sending the cells destined for the specified output port selectively inhibits the forwarding or sending out of cells according to the order of priority of the cells in response to the notice of congestion informed to each of the input line interfaces from the congestion notifier 4 by way of the signal line 19" (Column 4, lines 54-62) and "upon reaching a second threshold Th2, the high priority cells destined for the specified output port are also prohibited from flowing into the switching unit 3" (Column 5, lines 2-5).

Nakayama does not explicitly teach:

E) wherein each of the plurality of queue items has a corresponding queue item priority and a corresponding output port from the one or more output ports; and

F) wherein each of the plurality of output queues at an output port has a corresponding queue priority.

Erimli, however, teaches **"wherein each of the plurality of queue items has a corresponding queue item priority and a corresponding output port from the one or more output ports"** as "The output queues 310 may include priority queues 312-318. The priority queue 312 may store forwarding descriptors for packets of priority 0 (low priority) that await transmission from the corresponding output port. The priority queue 314 may store forwarding descriptors for packets of priority 1 (medium-low priority) that await transmission from the corresponding output port. The priority queue 316 may store forwarding descriptors for packets of priority 2 (medium-high priority) that await transmission from the corresponding output port. The priority queue 318 may store forwarding descriptors for packets of priority 3 (high priority) that await

transmission from the corresponding output port" (Column 7, lines 4-16) and **"wherein each of the plurality of output queues at an output port has a corresponding queue priority"** as "The output queues 310 may include priority queues 312-318. The priority queue 312 may store forwarding descriptors for packets of priority 0 (low priority) that await transmission from the corresponding output port. The priority queue 314 may store forwarding descriptors for packets of priority 1 (medium-low priority) that await transmission from the corresponding output port. The priority queue 316 may store forwarding descriptors for packets of priority 2 (medium-high priority) that await transmission from the corresponding output port. The priority queue 318 may store forwarding descriptors for packets of priority 3 (high priority) that await transmission from the corresponding output port" (Column 7, lines 4-16).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Erimli's** would have allowed **Nakayama's** to provide a method to mask certain priorities to prevent other (possibly higher) priorities from being flow controlled, as noted by **Erimli** (Column 1, lines 40-46).

Regarding claim 2, **Nakayama** does not explicitly teach a method comprising: A) wherein the pre-determined amount is a capacity of the particular one of the plurality of output queues.

Erimli, however, teaches **"wherein the pre-determined amount is a capacity of the particular one of the plurality of output queues"** as "When the number of

items of each particular priority in an output queue 310 exceeds the threshold, the output queue 310 generates a threshold signal" (Column 7, lines 26-28)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Erimli's** would have allowed **Nakayama's** to provide a method to mask certain priorities to prevent other (possibly higher) priorities from being flow controlled, as noted by **Erimli** (Column 1, lines 40-46).

Regarding claim 3, **Nakayama** further teaches a method comprising:

A) wherein the queue items are packets in a packet-switching fabric (Column 4, lines 32-50).

The examiner notes that Nakayama teaches **"wherein the queue items are packets in a packet-switching fabric"** as "a packet switch comprises a plurality of input line interfaces 1 (1—1 to t-n) connected to input lines...(LI-1 to LI-n)" (Column 4, lines 32-36).

Regarding claim 4, **Nakayama** further teaches a method comprising:

A) wherein, upon exit of a packet from one of the plurality of output queues, the packet is transmitted over the packet-switching fabric (Column 4, lines 32-50).

The examiner notes that Nakayama teaches **"wherein, upon exit of a packet from one of the plurality of output queues, the packet is transmitted over the packet-switching fabric"** as "a plurality of output line interfaces 2 (2-1 to w-n) each

connected to one of the switch output ports to restore the original IP packet from the cells received from the output port and send that IP packet to the output line OUT (OUT-1 to OUT-n) associated therewith" (Column 4, lines 40-45).

Regarding claim 5, **Nakayama** further teaches a method comprising:

A) wherein if any of the plurality of output queues contains a number of queue items that meets or exceeds the pre-determined amount, no queue items are allowed to exit the input queue until all of the plurality of output queues contain numbers of queue items that are less than the pre-determined amount (Column 5, lines 5-11).

The examiner notes that Nakayama teaches **"wherein if any of the plurality of output queues contains a number of queue items that meets or exceeds the pre-determined amount, no queue items are allowed to exit the input queue until all of the plurality of output queues contain numbers of queue items that are less than the pre-determined amount"** as "and once the number of cells stored for the specified output port has sufficiently decreased due to prohibiting the supply of cells to the switching unit, the suppression of the input of cells to the switch unit may be cancelled to once again allow the cells to flow into the switching unit 3 in the order of high priority first" (Column 4, lines 5-11).

Regarding claim 6, **Nakayama** does not explicitly teach a method comprising:

A) wherein the pre-determined amount is a capacity of the particular one of the plurality of output queues.

Erimli, however, teaches **"wherein the pre-determined amount is a capacity of the particular one of the plurality of output queues"** as "When the number of items of each particular priority in an output queue 310 exceeds the threshold, the output queue 310 generates a threshold signal" (Column 7, lines 26-28)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Erimli's** would have allowed **Nakayama's** to provide a method to mask certain priorities to prevent other (possibly higher) priorities from being flow controlled, as noted by **Erimli** (Column 1, lines 40-46).

Regarding claim 7, **Nakayama** teaches a computer program product comprising:

A) receiving a plurality of queue items at an input queue (Column 4, lines 51-62, Figure 1);

B) wherein the input queue feeds a plurality of output queues that feed one or more output ports (Column 4, lines 32-40, Figure 1);

C) determining whether a particular one of a plurality of output queues contains a number of queue items that meets or exceeds a pre-determined amount (Column 4, lines 51-67-Column 5, lines 1-11); and

D) in response to a determination that the particular one of the plurality of output queues contains a number of queue items that meets or exceeds the predetermined amount, preventing any queue items that have a same corresponding output port as the particular one of the plurality of output queues and that have a queue item priority

greater than or equal to the queue priority of the particular one of the plurality of output queues from exiting the input queue (Column 4, lines 63-67-Column 5, lines 1-11).

The examiner notes that **Nakayama** teaches **"receiving a plurality of queue items at an input queue"** as "a plurality of packets destined for the same output port are input simultaneously partially over a time base from a plurality of input lines" (Column 4, lines 52-54). The examiner further notes that **Nakayama** teaches **"wherein the input queue feeds a plurality of output queues that feed one or more output ports"** as "sending the cells to switch input ports LI (LI-1 to LI-n); a switching unit 3 having a plurality of input ports LI-1 to LI-n and output ports LO-1 to LO-n and switching the input cells from the input ports to any one of the output ports specified by the routing information" (Column 4, lines 35-40). The examiner further notes that **Nakayama** teaches **"determining whether a particular one of a plurality of output queues contains a number of queue items that meets or exceeds a pre-determined amount"** as "the quantity of stored cells destined for a specified output port exceeds a predetermined threshold value within the switch, the input line interfaces sending the cells destined for the specified output port selectively inhibits the forwarding or sending out of cells according to the order of priority of the cells in response to the notice of congestion informed to each of the input line interfaces from the congestion notifier 4 by way of the signal line 19" (Column 4, lines 54-62). The examiner further notes that **Nakayama** teaches **"in response to a determination that the particular one of the plurality of output queues contains a number of queue items that meets or exceeds the predetermined amount, preventing any queue items that have a same**

corresponding output port as the particular one of the plurality of output queues and that have a queue item priority greater than or equal to the queue priority of the particular one of the plurality of output queues from exiting the input queue" as "the quantity of stored cells destined for a specified output port exceeds a predetermined threshold value within the switch, the input line interfaces sending the cells destined for the specified output port selectively inhibits the forwarding or sending out of cells according to the order of priority of the cells in response to the notice of congestion informed to each of the input line interfaces from the congestion notifier 4 by way of the signal line 19" (Column 4, lines 54-62) and "upon reaching a second threshold Th2, the high priority cells destined for the specified output port are also prohibited from flowing into the switching unit 3" (Column 5, lines 2-5).

Nakayama does not explicitly teach:

E) wherein each of the plurality of queue items has a corresponding queue item priority and a corresponding output port from the one or more output ports; and

F) wherein each of the plurality of output queues at an output port has a corresponding queue priority.

Erimli, however, teaches **"wherein each of the plurality of queue items has a corresponding queue item priority and a corresponding output port from the one or more output ports"** as "The output queues 310 may include priority queues 312-318. The priority queue 312 may store forwarding descriptors for packets of priority 0 (low priority) that await transmission from the corresponding output port. The priority queue 314 may store forwarding descriptors for packets of priority 1 (medium-low

priority) that await transmission from the corresponding output port. The priority queue 316 may store forwarding descriptors for packets of priority 2 (medium-high priority) that await transmission from the corresponding output port. The priority queue 318 may store forwarding descriptors for packets of priority 3 (high priority) that await transmission from the corresponding output port" (Column 7, lines 4-16) and **"wherein each of the plurality of output queues at an output port has a corresponding queue priority"** as "The output queues 310 may include priority queues 312-318. The priority queue 312 may store forwarding descriptors for packets of priority 0 (low priority) that await transmission from the corresponding output port. The priority queue 314 may store forwarding descriptors for packets of priority 1 (medium-low priority) that await transmission from the corresponding output port. The priority queue 316 may store forwarding descriptors for packets of priority 2 (medium-high priority) that await transmission from the corresponding output port. The priority queue 318 may store forwarding descriptors for packets of priority 3 (high priority) that await transmission from the corresponding output port" (Column 7, lines 4-16).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Erimli's** would have allowed **Nakayama's** to provide a method to mask certain priorities to prevent other (possibly higher) priorities from being flow controlled, as noted by **Erimli** (Column 1, lines 40-46).

Regarding claim 8, **Nakayama** does not explicitly teach a computer program product comprising:

A) wherein the pre-determined amount is a capacity of the particular one of the plurality of output queues.

Erimli, however, teaches **"wherein the pre-determined amount is a capacity of the particular one of the plurality of output queues"** as "When the number of items of each particular priority in an output queue 310 exceeds the threshold, the output queue 310 generates a threshold signal" (Column 7, lines 26-28)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Erimli's** would have allowed **Nakayama's** to provide a method to mask certain priorities to prevent other (possibly higher) priorities from being flow controlled, as noted by **Erimli** (Column 1, lines 40-46).

Regarding claim 9, **Nakayama** further teaches a computer program product comprising:

A) wherein the queue items are packets in a packet-switching fabric (Column 4, lines 32-50).

The examiner notes that Nakayama teaches **"wherein the queue items are packets in a packet-switching fabric"** as "a packet switch comprises a plurality of input line interfaces 1 (1—1 to t-n) connected to input lines...(LI-1 to LI-n)" (Column 4, lines 32-36).

Regarding claim 10, **Nakayama** further teaches a computer program product comprising:

A) wherein, upon exit of a packet from one of the plurality of output queues, the packet is transmitted over the packet-switching fabric (Column 4, lines 32-50).

The examiner notes that Nakayama teaches **"wherein, upon exit of a packet from one of the plurality of output queues, the packet is transmitted over the packet-switching fabric"** as "a plurality of output line interfaces 2 (2-1 to w-n) each connected to one of the switch output ports to restore the original IP packet from the cells received from the output port and send that IP packet to the output line OUT (OUT-1 to OUT-n) associated therewith" (Column 4, lines 40-45).

Regarding claim 11, **Nakayama** further teaches a computer program product comprising:

A) wherein if any of the plurality of output queues contains a number of queue items that meets or exceeds the pre-determined amount, no queue items are allowed to exit the input queue until all of the plurality of output queues contain numbers of queue items that are less than the pre-determined amount (Column 5, lines 5-11).

The examiner notes that Nakayama teaches **"wherein if any of the plurality of output queues contains a number of queue items that meets or exceeds the pre-determined amount, no queue items are allowed to exit the input queue until all of the plurality of output queues contain numbers of queue items that are less than**

the pre-determined amount" as "and once the number of cells stored for the specified output port has sufficiently decreased due to prohibiting the supply of cells to the switching unit, the suppression of the input of cells to the switch unit may be cancelled to once again allow the cells to flow into the switching unit 3 in the order of high priority first" (Column 4, lines 5-11).

Regarding claim 12, **Nakayama** teaches a queuing system comprising:

A) an input queue (Column 4, lines 51-62, Figure 1);

B) a plurality of output queues (Column 4, lines 32-40, Figure 1);

C) wherein each of the plurality of output queues receives queue items from a head of the input queue (Column 4, lines 32-50)

D) wherein if a particular one of the plurality of output queues contains a number of queue items that meets or exceeds a pre-determined amount, no queue items that have a same corresponding output port as the particular one of the plurality of output queues and that have a queue item priority that is greater than or equal to that of the particular one of the plurality of output queues are allowed to exit the input queue until the particular one of the plurality of output queues contains a number of queue items that is less than the pre-determined amount (Column 4, lines 63-67-Column 5, lines 1-11).

The examiner notes that **Nakayama** teaches **"an input queue"** as "a plurality of packets destined for the same output port are input simultaneously partially over a time base from a plurality of input lines" (Column 4, lines 52-54). The examiner further notes that **Nakayama** teaches **"a plurality of output queues"** as "sending the cells to switch

input ports LI (LI-1 to LI-n); a switching unit 3 having a plurality of input ports LI-1 to LI-n and output ports LO-1 to LO-n and switching the input cells from the input ports to any one of the output ports specified by the routing information" (Column 4, lines 35-40). The examiner further notes that **Nakayama** teaches **"wherein each of the plurality of output queues receives queue items from a head of the input queue"** as "specified by the routing information contained in each of the cell headers" (Column 4, lines 39-40). The examiner further notes that **Nakayama** teaches **"wherein if a particular one of the plurality of output queues contains a number of queue items that meets or exceeds a pre-determined amount, no queue items that have a same corresponding output port as the particular one of the plurality of output queues and that have a queue item priority that is greater than or equal to that of the particular one of the plurality of output queues are allowed to exit the input queue until the particular one of the plurality of output queues contains a number of queue items that is less than the pre-determined amount"** as "the quantity of stored cells destined for a specified output port exceeds a predetermined threshold value within the switch, the input line interfaces sending the cells destined for the specified output port selectively inhibits the forwarding or sending out of cells according to the order of priority of the cells in response to the notice of congestion informed to each of the input line interfaces from the congestion notifier 4 by way of the signal line 19" (Column 4, lines 54-62) and "upon reaching a second threshold Th2, the high priority cells destined for the specified output port are also prohibited from flowing into the switching unit 3" (Column 5, lines 2-5).

Nakayama does not explicitly teach:

E) wherein each of the plurality of output queues is associated with a corresponding queue priority and a corresponding output port.

Erimli, however, teaches **"wherein each of the plurality of output queues is associated with a corresponding queue priority and a corresponding output port"** as "The output queues 310 may include priority queues 312-318. The priority queue 312 may store forwarding descriptors for packets of priority 0 (low priority) that await transmission from the corresponding output port. The priority queue 314 may store forwarding descriptors for packets of priority 1 (medium-low priority) that await transmission from the corresponding output port. The priority queue 316 may store forwarding descriptors for packets of priority 2 (medium-high priority) that await transmission from the corresponding output port. The priority queue 318 may store forwarding descriptors for packets of priority 3 (high priority) that await transmission from the corresponding output port" (Column 7, lines 4-16).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Erimli's** would have allowed **Nakayama's** to provide a method to mask certain priorities to prevent other (possibly higher) priorities from being flow controlled, as noted by **Erimli** (Column 1, lines 40-46).

Regarding claim 13, **Nakayama** does not explicitly teach a queuing system comprising:

A) wherein the pre-determined amount is a capacity of the particular one of the plurality of output queues.

Erimli, however, teaches **"wherein the pre-determined amount is a capacity of the particular one of the plurality of output queues"** as "When the number of items of each particular priority in an output queue 310 exceeds the threshold, the output queue 310 generates a threshold signal" (Column 7, lines 26-28)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Erimli's** would have allowed **Nakayama's** to provide a method to mask certain priorities to prevent other (possibly higher) priorities from being flow controlled, as noted by **Erimli** (Column 1, lines 40-46).

Regarding claim 14, **Nakayama** further teaches a queuing system comprising:
A) wherein the queue items are packets in a packet-switching fabric (Column 4, lines 32-50).

The examiner notes that Nakayama teaches **"wherein the queue items are packets in a packet-switching fabric"** as "a packet switch comprises a plurality of input line interfaces 1 (1—1 to t-n) connected to input lines...(LI-1 to LI-n)" (Column 4, lines 32-36).

Regarding claim 15, **Nakayama** further teaches a queuing system comprising:

A) wherein, upon exit of a packet from one of the plurality of output queues, the packet is transmitted over the packet-switching fabric (Column 4, lines 32-50).

The examiner notes that Nakayama teaches **"wherein, upon exit of a packet from one of the plurality of output queues, the packet is transmitted over the packet-switching fabric"** as "a plurality of output line interfaces 2 (2-1 to w-n) each connected to one of the switch output ports to restore the original IP packet from the cells received from the output port and send that IP packet to the output line OUT (OUT-1 to OUT-n) associated therewith" (Column 4, lines 40-45).

Regarding claim 16, **Nakayama** further teaches a queuing system comprising:
A) wherein if any of the plurality of output queues contains a number of queue items that meets or exceeds the pre-determined amount, no queue items are allowed to exit the input queue until all of the plurality of output queues contain numbers of queue items that are less than the pre-determined amount (Column 5, lines 5-11).

The examiner notes that Nakayama teaches **"wherein if any of the plurality of output queues contains a number of queue items that meets or exceeds the pre-determined amount, no queue items are allowed to exit the input queue until all of the plurality of output queues contain numbers of queue items that are less than the pre-determined amount"** as "and once the number of cells stored for the specified output port has sufficiently decreased due to prohibiting the supply of cells to the switching unit, the suppression of the input of cells to the switch unit may be cancelled

to once again allow the cells to flow into the switching unit 3 in the order of high priority first" (Column 4, lines 5-11).

Regarding claim 17, **Nakayama** does not explicitly teach a queuing system comprising:

A) wherein the pre-determined amount is a capacity of the particular one of the plurality of output queues.

Erimli, however, teaches **"wherein the pre-determined amount is a capacity of the particular one of the plurality of output queues"** as "When the number of items of each particular priority in an output queue 310 exceeds the threshold, the output queue 310 generates a threshold signal" (Column 7, lines 26-28)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Erimli's** would have allowed **Nakayama's** to provide a method to mask certain priorities to prevent other (possibly higher) priorities from being flow controlled, as noted by **Erimli** (Column 1, lines 40-46).

Regarding claim 19, **Nakayama** does not explicitly teach a queuing system comprising:

A) wherein each of the plurality of output queues receives only those queue items that have a queue item priority that matches the queue priority of that output queue.

Erimli, however, teaches **"wherein each of the plurality of output queues receives only those queue items that have a queue item priority that matches the queue priority of that output queue"** as "The output queues 310 may include priority queues 312-318. The priority queue 312 may store forwarding descriptors for packets of priority 0 (low priority) that await transmission from the corresponding output port. The priority queue 314 may store forwarding descriptors for packets of priority 1 (medium-low priority) that await transmission from the corresponding output port. The priority queue 316 may store forwarding descriptors for packets of priority 2 (medium-high priority) that await transmission from the corresponding output port. The priority queue 318 may store forwarding descriptors for packets of priority 3 (high priority) that await transmission from the corresponding output port" (Column 7, lines 4-16).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Erimli's** would have allowed **Nakayama's** to provide a method to mask certain priorities to prevent other (possibly higher) priorities from being flow controlled, as noted by **Erimli** (Column 1, lines 40-46).

Regarding claim 20, **Nakayama** further teaches a queuing system comprising:
A) wherein no queue item may exit one of the plurality of output queues if there is a non-empty higher-priority output queue (Column 5, lines 9-11, Column 6, lines 12-15).

The examiner notes that Nakayama teaches **"wherein no queue item may exit one of the plurality of output queues if there is a non-empty higher-priority output**

queue" as "one again allow the cells to flow into the switching unit 3 in the order of high priority" (Column 4, lines 9-11) and "a newly arrived high priority packet IP3 can overtake the previously arrived low priority packet IP2 at the input line interface" (Column 6, lines 13-15).

6. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Nakayama et al.** (U.S. Patent 6,907,001) and in view of **Erimli et al.** (U.S. Patent 6,842,423) as applied to claims 1-17, and 19-20 and further in view of **Wynne et al.** (U.S. Patent 6,959,002).

7. Regarding claim 18, **Nakayama** and **Erimli** do not explicitly teach a queuing system comprising:

A) wherein the queuing system is implemented as a logic circuit.

Wynne, however, teaches **"wherein the queuing system is implemented as a logic circuit"** as "When departure scheduler 46 (FIG. 4) operates in its port shaping mode as selected by input MODE control data to a queue control logic circuit 82" (Column 15, lines 8-10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the cited references because teaching **Wynne's** would have allowed **Nakayama's** and **Erimli's** to provide a hardwired circuit to optionally allocate forwarding bandwidth to flow queues with or without having to shape the forwarding rates of output resources", as noted by **Wynne** (Column 3, lines 51-54).

Response to Arguments

8. Applicant's arguments filed on 11/21/2006 have been fully considered but they are not persuasive.

Applicant goes on to argue on page 6, that **"Specifically, independent claims 1, 7, and 12 recite a feature of "in response to a determination that the particular one of the plurality of output queues contains a number of queue items that meets or exceeds the predetermined amount, preventing any queue items that have a same corresponding output port as the particular one of the plurality of output queues and that have a queue item priority greater than or equal to the queue priority of the particular one of the plurality of output queues from exiting the input queue", which is neither taught nor suggested by the cited references"**. However, the examiner wishes to point to Columns 4 and 5 of **Nakayama** which state "the quantity of stored cells destined for a specified output port exceeds a predetermined threshold value within the switch, the input line interfaces sending the cells destined for the specified output port selectively inhibits the forwarding or sending out of cells according to the order of priority of the cells in response to the notice of congestion informed to each of the input line interfaces from the congestion notifier 4 by way of the signal line 19" (Column 4, lines 54-62) and "upon reaching a second threshold Th2, the high priority cells destined for the specified output port are also prohibited from flowing into the switching unit 3" (Column 5, lines 2-5). The examiner further wishes to state that **Nakayama's** method clearly allows for higher priority packets from moving on by blocking them (see "the high priority cells destined for the specified output port are also prohibited from flowing into the switching unit 3"). The

examiner further wishes to state that since all of the packets are eventually blocked when reaching a threshold (see "Th2"), then the high priority packets are prevented from moving on.

Applicant goes on to argue on page 6, that **"The Examiner agues that this feature is taught by Nakayama. A closer examination of Nakayama, however, reveals that Nakayama actually teaches away from the present invention by teaching what might be characterized as the opposite of what is recited in independent claims 1, 7, and 12. The cited portion of Nakayama relied upon by the Examiner teaches a process in which packet congestion is addressed by first blocking low priority packets, then, if the congestion is addressed by first blocking low priority packets, then, if the congestion becomes worse, eventually blocking all packets until the congestion clears"**. However, the examiner wishes to point to Columns 4 and 5 of **Nakayama** which state "the quantity of stored cells destined for a specified output port exceeds a predetermined threshold value within the switch, the input line interfaces sending the cells destined for the specified output port selectively inhibits the forwarding or sending out of cells according to the order of priority of the cells in response to the notice of congestion informed to each of the input line interfaces from the congestion notifier 4 by way of the signal line 19" (Column 4, lines 54-62) and "upon reaching a second threshold Th2, the high priority cells destined for the specified output port are also prohibited from flowing into the switching unit 3" (Column 5, lines 2-5). The examiner further wishes to state that **Nakayama's** method clearly allows for higher priority packets from moving on by blocking them (see "the high

priority cells destined for the specified output port are also prohibited from flowing into the switching unit 3"). The examiner further wishes to state that since all of the packets are eventually blocked when reaching a threshold (see "Th2"), then the high priority packets are prevented from moving on. Applicants are also reminded that in order to disqualify a reference based on a "teach away" reasoning, the reference has to *explicitly* suggest or disclose the so-called teach away steps - Applicants assertion can not be accepted if it is unsupported by a valid evidence. In this case, independent claims 1, 7, and 12 merely state the limitation **"preventing any queue items that have a same corresponding output port as the particular one of the plurality of output queues and that have a queue item priority greater than or equal to the queue priority of the particular one of the plurality of output queues from exiting the input queue"**. The examiner further wishes to state that since the high-priority packets are blocked when threshold th2 is exceeded, then **Nakayama** teaches the aforementioned limitation.

Applicant goes on to argue on pages 6-7, that **"Thus, while Nakayama teaches blocking low priority packets to allow higher priority packets to pass, independent claims 1, 7, and 12 recite the opposite—namely, preventing only the higher priority queue items (specifically, those having a priority greater than or equal to that of the congested queue) from exiting the input queue, thus allow lower priority queue items to exit the queue while blocking higher priority queue items from exiting"**. However, the examiner wishes to point to Columns 4 and 5 of **Nakayama** which state "the quantity of stored cells destined for a specified output port exceeds a predetermined threshold value within the switch, the input line interfaces

sending the cells destined for the specified output port selectively inhibits the forwarding or sending out of cells according to the order of priority of the cells in response to the notice of congestion informed to each of the input line interfaces from the congestion notifier 4 by way of the signal line 19" (Column 4, lines 54-62) and "upon reaching a second threshold Th2, the high priority cells destined for the specified output port are also prohibited from flowing into the switching unit 3" (Column 5, lines 2-5). The examiner further wishes to state that **Nakayama's** method clearly allows for higher priority packets from moving on by blocking them (see "the high priority cells destined for the specified output port are also prohibited from flowing into the switching unit 3"). The examiner further wishes to state that since all of the packets are eventually blocked when reaching a threshold (see "Th2"), then the high priority packets are prevented from moving on. Moreover, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., **"allow lower priority queue items to exit the queue while blocking higher priority queue items from exiting"**) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant goes on to argue on pages 7-8, that **"The examiner relies on Erimli as teaching multiple prioritized output queues. However, Erimli still does not teach or suggest the feature of preventing queue items that have a queue item priority greater than or equal to the queue priority of the particular one of the**

plurality of output queues from exiting the input queue". However, the examiner wishes to state that **Nakayama** is relied upon to teach the aforementioned limitation throughout the final office action mailed on 08/22/2006. The examiner only relies on **Erimli** to teach the limitations "wherein each of the plurality of queue items has a corresponding queue item priority and a corresponding output port from the one or more output ports" and "wherein each of the plurality of output queues at an output port has a corresponding queue priority" (see pages 4-5 of the final office action mailed on 08/22/2006).

Applicant goes on to argue on page 8, that **"Specifically, Nakayama fails to teach or suggest the claimed feature of "in response to a determination that the particular one of the plurality of output queues contains a number of queue items that meets or exceeds the pre-determined amount, preventing any queue items...from exiting the input queue"**. However, the examiner wishes to point to Columns 4 and 5 of **Nakayama** which state "the quantity of stored cells destined for a specified output port exceeds a predetermined threshold value within the switch, the input line interfaces sending the cells destined for the specified output port selectively inhibits the forwarding or sending out of cells according to the order of priority of the cells in response to the notice of congestion informed to each of the input line interfaces from the congestion notifier 4 by way of the signal line 19" (Column 4, lines 54-62) and "upon reaching a second threshold Th2, the high priority cells destined for the specified output port are also prohibited from flowing into the switching unit 3" (Column 5, lines 2-5). The examiner further wishes to state that **Nakayama's** method clearly allows for

higher priority packets from moving on by blocking them (see "the high priority cells destined for the specified output port are also prohibited from flowing into the switching unit 3"). The examiner further wishes to state that since all of the packets are eventually blocked when reaching a threshold (see "Th2"), then the high priority packets are prevented from moving on.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 5,309,432 issued to **Kanakia** on 03 May 1994. The subject matter disclosed therein is pertinent to that of claims 1-20 (e.g., methods to switch packets based on priority).

U.S. Patent 6,091,709 issued to **Harrison et al.** on 18 July 2000. The subject matter disclosed therein is pertinent to that of claims 1-20 (e.g., methods to switch packets based on priority).

U.S. Patent 5,541,912 issued to **Choudhury et al.** on 30 July 1996. The subject matter disclosed therein is pertinent to that of claims 1-20 (e.g., methods to switch packets based on priority).

U.S. Patent 7,058,064 issued to **Nemirovsky et al.** on 06 June 2006. The subject matter disclosed therein is pertinent to that of claims 1-20 (e.g., methods to switch packets based on priority).

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mahesh Dwivedi whose telephone number is (571) 272-2731. The examiner can normally be reached on Monday to Friday 8:20 am – 4:40 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Vo can be reached (571) 272-3642. The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mahesh Dwivedi

Patent Examiner

Art Unit 2168

February 06, 2007

Leslie Wong

Primary Examiner

TIM VO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100